

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claim 1 (Currently Amended): An image output control system comprising an image processing device that makes image data subjected to a preset series of image processing and an image output device that creates dots according to a result of the preset series of image processing to output an image,

said image processing device comprising:

a pixel group generation module that sequentially extracts, from the image, a plurality of pixel groups, each of the pixel groups comprising a predetermined number of pixels selected from among pixels constituting the image;

a dot number specification module that ~~collects a predetermined number of plural pixels, among a large number of pixels constituting the image, to each pixel group and specifies number of dots to be created in each pixel group according to the image data~~ specifies a number of dots to be created in each of the pixel groups, said number of dots being specified based on a result of comparison between a tone value of each of the pixels constituting each of the pixel groups and a corresponding threshold value mapped in each of dither matrices, which is provided to each of the pixel groups, wherein each of the dither matrices comprises a plurality of threshold values selected from among various types of threshold values, the number of which is greater than the number of the pixels included in each of the pixel groups, and maps the plurality of threshold values in a two-dimensional array; and

a number data supply module that supplies dot number data representing the number of dots specified with regard to each pixel group to said image output device,

said image output device comprising:

a number data receiving module that receives the dot number data with regard to each pixel group;

a priority order selection module that selects a priority order of pixels for dot formation in each pixel group;

a pixel position determination module that determines position of each dot-on pixel included in each pixel group, based on the received dot number data and the selected priority order; and

a dot formation module that actually creates a dot at the determined position of each dot-on pixel.

Claim 2 (Original): An image output control system in accordance with claim 1, wherein said priority order selection module selects one priority order for each pixel group, among multiple priority orders prepared in advance.

Claim 3 (Canceled).

Claim 4 (Currently Amended): An image output control system in accordance with claim 1, wherein ~~said dot number specification module refers to a dither matrix, which maps threshold values to respective pixels arranged in a two dimensional array, and specifies the number of dots to be created in each pixel group, and~~ said priority order selection module divides the dither matrix referred to for the dot number specification into multiple groups corresponding to multiple pixel groups, specifies a priority order of pixels in each pixel group based on a result of comparison between the image data of respective pixels included in the pixel group and corresponding threshold values, and stores the specified priority orders of the multiple pixel groups as the multiple priority orders,

said priority order selection module selecting one priority order corresponding to a position of each pixel group in the image, among the multiple priority orders based on the dither matrix.

Claim 5 (Currently Amended): An image output device that receives processed image data, which has gone through a preset series of image processing, and creates dots according to the received image data to output an image, said image output device comprising:

a number data receiving module that receives dot number data representing a number of dots to be created in each pixel group, the number of dots to be created in each pixel group being obtained by comparing a tone value of each of the pixels constituting each of the pixel groups and a corresponding threshold value mapped in each of dither matrices where a plurality of threshold values selected from among various types of threshold values, the number of which is greater than the number of the pixels included in each of the pixel groups, is mapped in a two-dimensional array, as the image data, ~~where~~ wherein the pixel group includes a predetermined number of plural pixels collected from among a large number of pixels constituting the image;

a priority order selection module that selects a priority order of pixels for dot formation in each pixel group;

a pixel position determination module that determines position of each dot-on pixel included in each pixel group, based on the received dot number data and the selected priority order; and

a dot formation module that actually creates a dot at the determined position of each dot-on pixel.

Claim 6 (Original): An image output device in accordance with claim 5, wherein said priority order selection module selects one priority order for each pixel group, among multiple priority orders prepared in advance.

Claim 7 (Canceled).

Claim 8 (Original): An image output device in accordance with claim 5, wherein said number data receiving module receives the dot number data in each pixel group of plural pixels that are adjacent to one another and have a preset positional relation.

Claims 9-19 (Canceled).

Claim 20 (Currently Amended): An image output control method that makes image data subjected to a preset series of image processing and creates dots according to a result of the preset series of image processing to output an image,

said image output control method comprising:

a first step of ~~collecting a predetermined number of plural pixels, among a large number of pixels constituting the image, to each pixel group and specifying number of dots to be created in each pixel group according to the image data~~ specifying a number of dots to be created in each of a plurality of pixel groups, said number of dots being specified based on a result of comparison between a tone value of each of the pixels constituting each of the pixel groups and a corresponding threshold value mapped in each of dither matrices, which is provided to each of the pixel groups, wherein each of the dither matrices comprises a plurality of threshold values selected from among various types of threshold values, the number of

which is greater than the number of the pixels included in each of the pixel groups, and mapping the plurality of threshold values in a two-dimensional array;

a second step of selecting a priority order of pixels for dot formation in each pixel group;

a third step of determining position of each dot-on pixel included in each pixel group, based on the specified number of dots and the selected priority order of the pixel group; and

a fourth step of actually creating a dot at the determined position of each dot-on pixel.

Claim 21 (Currently Amended): An image output control method in accordance with claim 20, wherein ~~said first step refers to a dither matrix, which maps threshold values to respective pixels arranged in a two-dimensional array, and specifies the number of dots to be created in each pixel group, and~~ said second step divides the dither matrix referred to for the dot number specification into multiple groups corresponding to multiple pixel groups, specifies a priority order of pixels in each pixel group based on a result of comparison between the image data of respective pixels included in the pixel group and corresponding threshold values, and stores the specified priority orders of the multiple pixel groups,

said second step selecting one priority order corresponding to a position of each pixel group in the image, among multiple priority orders stored with regard to the multiple groups of the dither matrix.

Claim 22 (Currently Amended): An image output method that receives processed image data, which has gone through a preset series of image processing, and creates dots according to the received image data to output an image, said image output method comprising the steps of:

(A) receiving dot number data representing a number of dots to be created in each pixel group, the number of dots to be created in each pixel group being obtained by comparing a tone value of each of the pixels constituting each of the pixel groups and a corresponding threshold value mapped in each of dither matrices where a plurality of threshold values selected from among various types of threshold values, the number of which is greater than the number of the pixels included in each of the pixel groups, is mapped in a two-dimensional array, as the image data, ~~where~~ wherein the pixel group includes a predetermined number of plural pixels collected from among a large number of pixels constituting the image;

- (B) selecting a priority order of pixels for dot formation in each pixel group;
- (C) determining position of each dot-on pixel included in each pixel group, based on the received dot number data and the selected priority order; and
- (D) actually creating a dot at the determined position of each dot-on pixel.

Claim 23 (Canceled).

Claim 24 (Currently Amended): An image output control program, stored on a computer-readable storage medium, that is executed by a computer to make image data subjected to a preset series of image processing, create dots according to a result of the preset series of image processing, and thereby output an image,

said image output control program causing the computer to attain:

a first function of ~~collecting a predetermined number of plural pixels, among a large number of pixels constituting the image, to each pixel group and specifying number of dots to be created in each pixel group according to the image data~~ specifying a number of dots to be created in each of a plurality of pixel groups, said number of dots being specified based on a result of comparison between a tone value of each of the pixels constituting each of the pixel groups and a corresponding threshold value mapped in each of dither matrices, which is provided to each of the pixel groups, wherein each of the dither matrices comprises a plurality of threshold values selected from among various types of threshold values, the number of which is greater than the number of the pixels included in each of the pixel groups, and mapping the plurality of threshold values in a two-dimensional array;

a second function of selecting a priority order of pixels for dot formation in each pixel group;

a third function of determining position of each dot-on pixel included in each pixel group, based on the specified number of dots and the selected priority order of the pixel group; and

a fourth function of actually creating a dot at the determined position of each dot-on pixel.

Claim 25 (Currently Amended): An image output control program in accordance with claim 24, wherein ~~said first function refers to a dither matrix, which maps threshold values to respective pixels arranged in a two-dimensional array, and specifies the number of dots to be created in each pixel group, and~~ said second function divides the dither matrix referred to for the dot number specification into multiple groups corresponding to multiple pixel groups, specifies a priority order of pixels in each pixel group based on a result of comparison between the image data of respective pixels included in the pixel group and corresponding threshold values, and stores the specified priority orders of the multiple pixel groups,

said second function selecting one priority order corresponding to a position of each pixel group in the image, among multiple priority orders stored with regard to the multiple groups of the dither matrix.

Claim 26 (Currently Amended): An image output program, stored on a computer-readable storage medium, that is executed by a computer to receive processed image data, which has gone through a preset series of image processing, create dots according to the received image data, and thereby output an image, said image output program causing the computer to attain the functions of:

(A) receiving dot number data representing a number of dots to be created in each pixel group, the number of dots to be created in each pixel group being obtained by comparing a tone value of each of the pixels constituting each of the pixel groups and a corresponding threshold value mapped in each of dither matrices where a plurality of threshold values selected from among various types of threshold values, the number of which is greater than the number of the pixels included in each of the pixel groups, is mapped in a two-dimensional array, as the image data, ~~where~~ wherein the pixel group includes a predetermined number of plural pixels collected from among a large number of pixels constituting the image;

(B) selecting a priority order of pixels for dot formation in each pixel group;

(C) determining position of each dot-on pixel included in each pixel group, based on the received dot number data and the selected priority order; and

(D) actually creating a dot at the determined position of each dot-on pixel.

Claim 27 (Canceled).

Claim 28 (Currently Amended): An image output control system comprising an image processing device that makes image data subjected to a preset series of image processing and an image output device that creates dots according to a result of the preset series of image processing to output an image,

said image processing device comprising:

a pixel group setting module that collects a predetermined number of ~~plural~~ pixels, from among a large number of pixels constituting the image, to each ~~pixel group of a plurality of pixel groups~~;

~~a dot number specification module that causes at least a plurality of the pixel groups to have different relations between the image data of each pixel group and number of dots to be created in the pixel group, and specifies number of dots to be created in each pixel group according to the image data of the pixel group~~ specifies a number of dots to be created in each of the pixel groups, said number of dots being specified based on a result of comparison between a tone value of each of the pixels constituting each of the pixel groups and a corresponding threshold value mapped in each of dither matrices, which is provided to each of the pixel groups, wherein each of the dither matrices comprises a plurality of threshold values selected from among various types of threshold values, the number of which is greater than the number of the pixels included in each of the pixel groups, and maps the plurality of threshold values in a two-dimensional array; and

a number data supply module that supplies dot number data representing the number of dots specified with regard to each pixel group as the control data to said image output device,

said image output device comprising:

a number data receiving module that receives the dot number data with regard to each pixel group;

a pixel position determination module that determines position of each dot-on pixel in each pixel group, based on the received dot number data; and

a dot formation module that actually creates a dot at the determined position of each dot-on pixel.

Claim 29 (Canceled).

Claim 30 (Currently Amended): An image output control system comprising an image processing device that makes image data subjected to a preset series of image processing and an image output device that creates dots according to a result of the preset series of image processing to output an image,

said image processing device comprising:

a pixel group generation unit that sequentially extracts, from the image, a plurality of pixel groups, each of the pixel groups comprising a predetermined number of pixels selected from among pixels constituting the image;

a number specification unit that ~~collects a predetermined number of plural pixels, among a large number of pixels constituting the image, to each pixel group and specifies number of dots to be created in each pixel group according to the image data~~ specifies a number of dots to be created in each of the pixel groups, said number of dots being specified based on a result of comparison between a tone value of each of the pixels constituting each of the pixel groups and a corresponding threshold value mapped in each of dither matrices, which is provided to each of the pixel groups, wherein each of the dither matrices comprises a plurality of threshold values selected from among various types of threshold values, the number of which is greater than the number of the pixels included in each of the pixel groups, and maps the plurality of threshold values in a two-dimensional array; and

a data transmitter that supplies dot number data representing the number of dots specified with regard to each pixel group to said image output device,

said image output device comprising:

a data receiver that receives the dot number data with regard to each pixel group;

a selector that selects a priority order of pixels for dot formation in each pixel group;

an operator that determines position of each dot-on pixel included in each pixel group, based on the received dot number data and the selected priority order; and

a dot formation unit that actually creates a dot at the determined position of each dot-on pixel.

Claim 31 (Currently Amended): An image output device that receives processed image data, which has gone through a preset series of image processing, and creates dots according to the received image data to output an image, said image output device comprising:

a data receiver that receives dot number data representing a number of dots to be created in each pixel group, the number of dots to be created in each pixel group being obtained by comparing a tone value of each of the pixels constituting each of the pixel groups and a corresponding threshold value mapped in each of dither matrices where a plurality of threshold values selected from among various types of threshold values, the number of which is greater than the number of the pixels included in each of the pixel groups, is mapped in a two-dimensional array, as the image data, ~~where~~ wherein the pixel group includes a predetermined number of plural pixels collected from among a large number of pixels constituting the image;

a selector that selects a priority order of pixels for dot formation in each pixel group;
an operator that determines position of each dot-on pixel included in each pixel group, based on the received dot number data and the selected priority order; and

a dot formation unit that actually creates a dot at the determined position of each dot-on pixel.

Claim 32 (Canceled).

Claim 33 (Currently Amended): An image processing device that causes input image data representing an image to go through a preset series of image processing and thereby generates control data, which is used for control of dot formation by an image output device that creates dots and outputs a resulting processed image, said image processing device comprising:

a memory that stores a dither matrix, which maps threshold values to respective pixels arranged in a two-dimensional array;

a generator that ~~collects a predetermined number of plural pixels, among a large number of pixels constituting the image, to each pixel group~~ sequentially extracts, from the image, a plurality of pixel groups, each of the pixel groups comprising a predetermined number of pixels selected from among pixels constituting the image;

a comparator that compares the image data of respective pixels included in each pixel group with threshold values set at corresponding positions in the dither matrix stored in said memory, the comparator comparing a tone value of each of the pixels constituting each of the

pixel groups and a corresponding threshold value mapped in each of dither matrices, which is provided to each of the pixel groups, wherein each of the dither matrices comprises a plurality of threshold values selected from among various types of threshold values, the number of which is greater than the number of the pixels included in each of the pixel groups, and mapping the plurality of threshold values in the two-dimensional array;

a number specification unit that specifies number of dots to be created in the pixel group, based on a result of the comparison; and

a data transmitter that supplies dot number data representing the number of dots specified with regard to each pixel group as the control data to said image output device.